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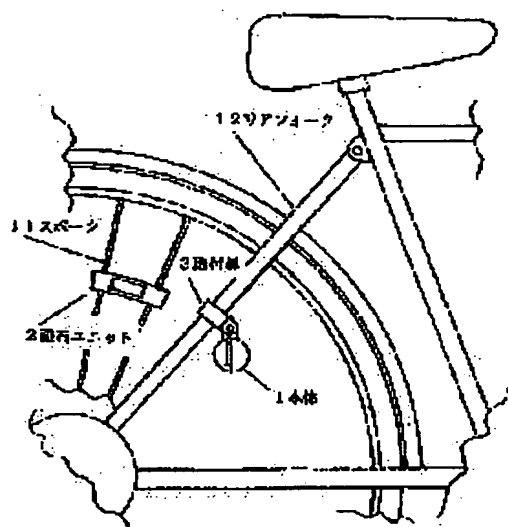
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(54) TAIL LAMP FOR BICYCLE



(57) Abstract:

PROBLEM TO BE SOLVED: To prevent an accident in which a body is bitten between turning spokes by providing a fitting lug on an upper half side of an outer circumference of the body, and fitting the body on the forward side of a rear fork.

SOLUTION: A power generating coil and a light-emitting diode are incorporated in a body 1, and a fitting lug is provided on an upper half side of an outer circumference. A clamp part of a fitting piece 3 is fitted to a rear fork 12, and tightened and fixed by fitting screws. The body 1 is fixed to the fitting lug. A magnet unit 2 incorporates a magnet, and is fitted to a spoke 11 by a holding plate and screws. The relative position of the body 1 to the magnet unit 2 is determined so that the coil gap is formed every time the spoke is turned, and the magnet is brought close to and away from

the power generating coil. When a bicycle travels, the magnet is brought close to the body 1, and the pulse voltage is generated in the power generating coil to turn on/turn off the light-emitting diode.

## [Claim(s)]

[Claim 1] (a) The body having the light emitting diode (5) connected to a magneto coil (4) and this (1), (\*\*) -- the magnet unit (2) attached in the spoke (11) of a rear wheel -- It consists of fixtures (3) of the letter of a clamp inserted in the rear fork (12) of a car body. and (\*\*) -- A body (1) is attached in a rear fork (12) by combining the attachment lug (10) of a periphery with a fixture (3) by the mounting screw. And a body (1) As the fitting location, whenever a magnet unit (2) rotates with a wheel Have a predetermined coil gap (13) and it approaches near the body (1). The tail lamp for bicycles characterized by being attached so that it may pass, and attaching a body (1) in the front side of a rear fork (12) further by preparing an attachment lug (10) in the upper half side of a body periphery.

[Claim 2] The tail lamp for bicycles finally characterized by making it the quick stop of a rear wheel not happen by an attachment lug being cut when a body (1) causes the contact accompanied by the spoke and impact under rotation by preparing the infeed (14) of the shape of a wedge of predetermined magnitude in the base part of the wheel side edge side of an attachment lug (10) in addition to claim 1.

## [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the tail lamp for bicycles with which it equips in order to make discernment of the bicycle from Nighttime and back easy. A headlight is especially related with the equipment which operates independently.

[0002]

[Description of the Prior Art] as a means to turn on the tail lamp for bicycles -- a headlight -- the approach of turning on by electric supply from the \*\* generator is already used. However, if you forget lighting of a headlight, this approach has the fault of not turning on a tail lamp, either, and must also perform wiring to the back of a car body. Also in the approach of on the other hand using a cell, a point and the switching circuit for putting out lights are required, and the changing battery under employment is also required. Therefore, as for a headlight, as a tail lamp for bicycles, it is desirable that it is equipment which has been independent and operates automatically by transit initiation. this -- corresponding -- the conventional headlight -- a different simple generation-of-electrical-energy method from the \*\* generator is proposed. That is, when attach a magneto coil in a car-body side, a magnet is attached in a wheel side, a wheel rotates and a magnet passes near the magneto coil, it is the way of thinking of the armature separation method of making a lamp turn on with the power of the shape of a pulse generated in a magneto coil. The following designs are indicated in relation to this. That is, the design for relation can be seen to publication of unexamined utility model application Showa 60-62872, publication of unexamined utility model application Showa 63-89889, publication of unexamined utility model application Showa 63-107446, publication of unexamined utility model application Showa 63-279982, JP, 2-293228, A, JP, 4-78677, A, JP, 5-319333, A, publication of unexamined utility model application Heisei 5-55774, JP, 7-25372, A, publication of unexamined utility model application Heisei 7-35278, etc. By this method, since generating power is generally very small, it is not suitable to turn on an incandescent lamp, but like the tail lamp for bicycles, with extent which the required power makes blink light emitting diode, when

good, it can use enough.

[0003]

[Problem(s) to be Solved by the Invention] In order to put a tail lamp in practical use with the above-mentioned generation-of-electrical-energy method, in addition, the next technical problem must be solved. In this method which is going to attach a magneto coil in a car-body side, and is going to attach a magnet in a wheel side, and it is going to generate by both approach accompanying rotation of a wheel, and passage, it is very important, the gap of both means of attachment or both at the time of a closest approach, i.e., a setup of a coil gap, other than the miniaturization of a coil or a magnet. It is desirable to attach a magneto coil in the rear fork of a car body, and to attach a magnet in the spoke of a rear wheel as a practical wearing gestalt of this method, and it is necessary to keep a coil gap at about 5mm or less. That is, during transit of a bicycle, the magnet which rotates at high speed must pass near the magneto coil with a small gap 5mm or less, and, naturally both do not contact. When both contact during transit by a certain cause, the accident bit between the spokes which each is not only damaged, but it is induced by contact depending on the case and the body by the side of a magneto coil rotates may also happen. In this case, as a result of a rear wheel's carrying out a quick stop, since a bicycle falls suddenly, possibility of becoming a serious accident resulting in injury or death is expected.

[0004] furthermore, actually, since it usually comes out for equipment not to be equipped with and shipped by the plant of a bicycle, but for a user to purchase kit components, and to attach in person and the tail lamp of this method has it, a user's activity must have a mistake or it must expect that maintenance and check are not necessarily enough, either. Therefore, even if a user's activity has a mistake, at least, the above will bite and a cure which does not take place will be required for lump accident. That is, in order to complete this equipment as daily necessities, solution of the problem on such safety is needed.

[0005]

[Means for Solving the Problem] With this equipment, solution is aimed at with the following means to the above-mentioned technical problem. This equipment consists of magnet units attached in a magneto coil, the body having the light emitting diode linked to this, and the fixture for attaching this in a car body and a wheel. A body is attached in the rear fork of a car body, and a magnet unit is attached in the spoke of a rear wheel. Since these are members with the largest rigidity in the structure of a bicycle, they are the optimal as radical headquarters material for attaching a body and a magnet unit and holding a necessary coil gap.

[0006] As the 2nd means, a body is rotated to the front, i.e., advance of spoke of rear wheel, side of a rear fork, and it attaches in the side which passes a rear fork location and progresses. Even if according to such arrangement the body attached in the rear fork attaches, it rotates to a wheel side by a mistake or other causes and it contacts a spoke, since it is pushed back outside by rotation of a spoke, a body must have been bit between spokes. When the body is attached in the back side of a rear fork and contact to a spoke occurs, since the spoke which contacted pushes a body in the direction of the inside of a wheel, it surely bites and lump accident occurs.

[0007] As the 3rd safety practice, the fuse function to big impulse force is given by preparing wedge-like infeed in the base part of the attachment

lug of a body. Although the attachment lug which prepared infeed has sufficient reinforcement to a static load, if big impulse force is added, it will be cut. Consequently, since a body is separated from a rear fork when the contact accompanied by big impulse force occurs between a body and a spoke, it can bite, and lump accident can be prevented positively. [0008]

[Function] With this equipment, whenever a rear wheel rotates and a magnet passes near the magneto coil, light emitting diode blinks. Although the magnet unit attached in the spoke whenever the wheel rotated approaches and passes near the body fixed to the rear fork with this equipment, even if both contact, a major accident by which a body is bit between spokes does not happen. [0009]

[Example] Hereafter, the example of this invention is explained using a drawing. This equipment consists of a body (1), a magnet unit (2), and a fixture (3). Drawing 1 is the right side view of the rear wheel section of a bicycle which attached this equipment. A body (1) is attached in a rear fork (12) using a fixture (3), and a magnet unit (2) attaches it in a spoke (11).

[0010] Drawing 2 is the perspective view of a body (1) and a fixture (3). A body (1) contains a magneto coil (4) and light emitting diode (5), and prepares an attachment lug (10) in the upper half side of a periphery. A fixture (3) is the attachment material of the letter of a clamp, and inserts the clamp section in a rear fork. By the mounting screw (7), it fastens and fixes. At this time, by thrusting the same mounting screw as a body attachment lug (10), the attachment lug of a body, a fixture, and a rear fork are \*\*\*\*\* (ed) to coincidence, and these are united with it.

[0011] Drawing 3 is the detail of the attachment section of a magnet unit (2). A magnet unit (2) builds in a magnet (8) and attaches it in a spoke according to a pressure plate (9) and \*\*\*\*. The relative position of a body (1) and a magnet unit (2) is arranged so that a magnet (8) may approach a magneto coil (4) with a coil gap (13) whenever a spoke rotates, as shown in drawing 4, and it may pass.

[0012] Drawing 4 is the crossing top view of a body (1), and shows arrangement of a magneto coil (4) and light emitting diode (5). Moreover, the relative position of the magnet (8) and magneto coil which carried out the closest approach is also shown in a body. Arrow-head [ of drawing ] A (15) is the advance direction of a bicycle. In order to raise a generated voltage to a magneto coil, an iron core is added if needed. A generated voltage becomes so large that a coil gap is so small that the relative velocity of a coil and a magnet is so large that the number of turns of a coil besides an iron core are large.

[0013] Drawing 5 is the connection circuit of a magneto coil and light emitting diode. To the both ends of a magneto coil, a polarity is made reverse and two light emitting diodes are connected to juxtaposition. The lens for light source augmentation (6) is attached in the front face of light emitting diode like drawing 4 if needed.

[0014] the light emitting diode which the pulse-like electrical potential difference occurred in the magneto coil (4) whenever according to above configurations and arrangement the bicycle ran and the magnet (8) approached and passed near the body (1), and was connected -- a short time -- the light is switched on. Although the light emitting diode by the side of the forward direction lights up one piece at a time since a polarity is reversed before and after a magnet passes, it seems to

this pulse voltage that both light up to coincidence in fact.

[0015] Drawing 6 is the right side view of the body attachment section, and arrow-head A (15) is the advance direction of a bicycle. A body (1) uses a mounting screw (7) and is fixed to a rear fork (12) by \*\*\*\*\* (ing) an attachment lug (10) and a fixture (3). At this time, since the attachment lug (10) is prepared in the upper half side of a body periphery, a body (1) is automatically attached in the front, i.e., advance direction of bicycle, side of a rear fork.

[0016] Drawing 7 is the A-A \*\* Fig. of drawing 6, is united and is also adding the cross section of the wheel spoke section. Arrow-head [ of drawing ] A (15) is the advance direction of a bicycle. The gap of a body (1) and a magnet unit (2), i.e., a coil gap, carries out whether on both sides of SIMM, a body (1) is rotated around a rear fork between an attachment lug (10) and a fixture (3), and it is adjusted to it. Although the smaller one of a coil gap is good for raising a generated voltage, in order to reduce the possibility of contact to a body, a magnet unit, or a spoke, it is set as about 5mm.

[0017] Drawing 8 is an A-A \*\* Fig. when a body (1) causes the rotation which is not meant around a rear fork and contacts a spoke. Such a minor collision that is not meant may happen, when it attached and bolting of a fixture loosened for a mistake or degradation of the quality of the material, or when a body is strongly pushed by the body, a load, etc. However, since a body (1) is pushed back by rotation of a spoke in the direction of arrow-head B (16), i.e., the outside of surface of revolution, such even case, contact is solved, and what a body (1) is bit between spokes cannot happen.

[0018] Drawing 9 is the right side view of the body attachment section as well as drawing 6. However, drawing 9 is the case where a body (1) is attached in the back side of a rear fork, contrary to drawing 6. If the attachment lug (10) is prepared in the lower half side of a body periphery, a body will be inevitably attached behind a rear fork and will serve as such a gestalt. Drawing 10 is the B-B \*\* Fig. of drawing 9, conditions are the same as the case of drawing 7, and arrow-head A (15) is the advance direction of a bicycle.

[0019] Drawing 11 is a B-B \*\* Fig. at the time of causing the rotation which a body (1) does not mean like drawing 8, and contacting a spoke. In this case, since the spoke to rotate pushes a body (1) in the direction of the inside of arrow-head B (16), i.e., the direction of a wheel, unlike the case of drawing 8, a body will be bit inevitably between spokes. Consequently, since a rear wheel carries out a quick stop suddenly, therefore fall accident is brought about, this attachment gestalt is not desirable on a safety practice.

[0020] As shown in drawing 12 as a still more positive means for a body biting and preventing lump accident, the method of preparing wedge-like infeed (14) is effective in the base part of an attachment lug (10). Drawing 12 is the front view of the body (1) seen from the front, and infeed (14) is prepared in the wheel side edge side of an attachment lug base part. Enough, although \*\*\*\*\* of an attachment lug is given, it builds local stress raisers with this means in the infeed section. Therefore, since the stress of the infeed section will exceed a tolerance limit if the impact by contact is great, an attachment lug is cut. Consequently, although a body (1) falls out from a rear fork instead, a bite lump does not take place and the damage on by the side of a wheel can also be prevented. The magnitude of infeed measures and sets up the maximum stress at the time of contact.

[0021]

[Effect of the Invention] Since light emitting diode will blink automatically if the bicycle furnished with this equipment runs, transit of a bicycle is easily discriminable from back at night. Wiring from the cell and headlight for actuation of this equipment is unnecessary. Moreover, even when the situation where a body contacts the spoke of a wheel by a certain cause occurs, since accident by which a body is bit between spokes cannot happen, safety is very high [ accident ].

[Brief Description of the Drawings]

[Drawing 1] It is the right side view of the rear wheel section of a bicycle which attached this equipment.

[Drawing 2] It is the perspective view of a body (1) and a fixture (3).

[Drawing 3] It is the side elevation of the attachment section of a magnet unit (2).

[Drawing 4] It is each crossing top view when a magnet (8) carries out a closest approach to a body (1).

[Drawing 5] It is a circuit diagram inside a body (1).

[Drawing 6] It is the right side view of the attachment section of a body (1).

[Drawing 7] It is an A-A \*\* Fig. in drawing 6 . However, it is the A-A \*\* Fig. having also united and shown the cross section of the wheel spoke section.

[Drawing 8] In drawing 7 , it is the A-A \*\* Fig. showing the physical relationship of both when a body (1) and a spoke (11) contact.

[Drawing 9] It is the right side view of the attachment section of a body (1). However, it is the case where a body (1) is attached behind a rear fork.

[Drawing 10] It is a B-B \*\* Fig. in drawing 9 . And the cross section of the wheel spoke section is also shown.

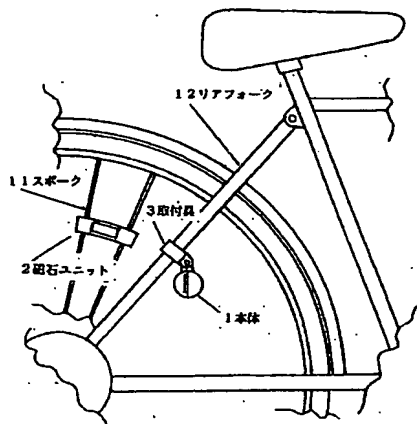
[Drawing 11] In drawing 10 , it is the B-B \*\* Fig. showing the physical relationship of both when a body (1) and a spoke (11) contact.

[Drawing 12] It is the front view of the body (1) seen from the front.

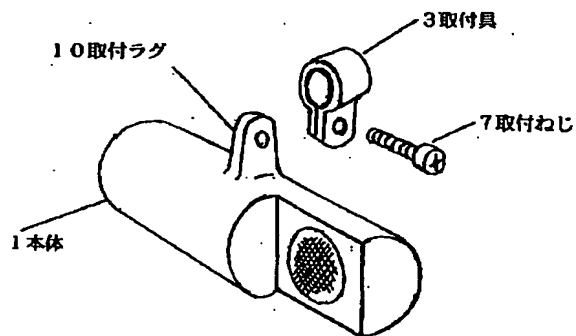
[Description of Notations]

- 1 Body
- 2 Magnet Unit
- 3 Fixture
- 4 Magneto Coil
- 5 Light Emitting Diode
- 6 Lens
- 7 Mounting Screw
- 8 Magnet
- 9 Pressure Plate
- 10 Attachment Lug
- 11 Spoke
- 12 Rear Fork
- 13 Coil Gap
- 14 Infeed
- 15 Arrow Head A
- 16 Arrow Head B

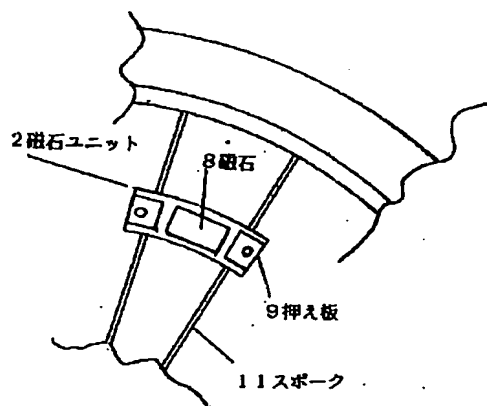
[Drawing 1]



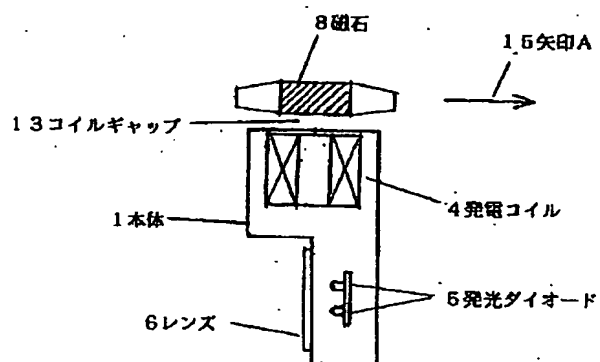
[Drawing 2]



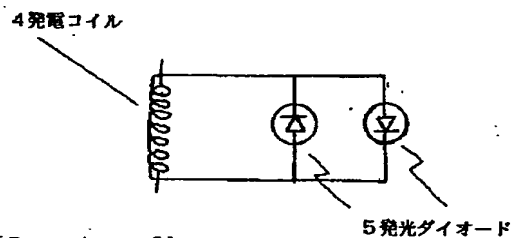
[Drawing 3]



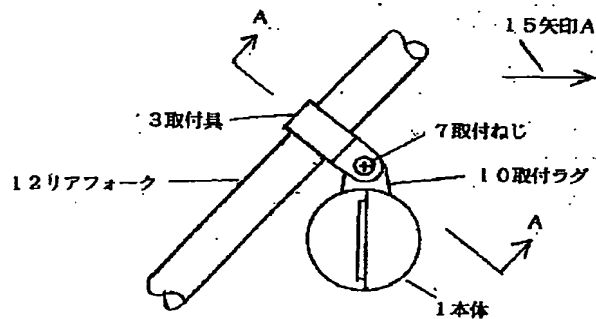
[Drawing 4]



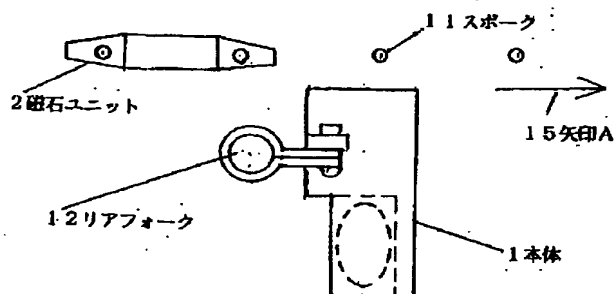
[Drawing 5]



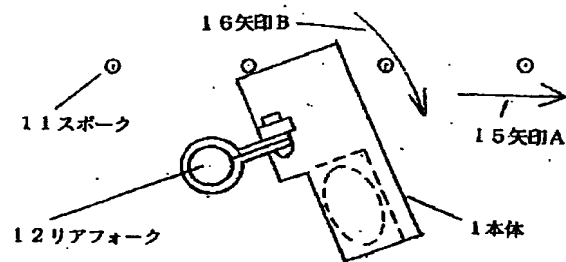
[Drawing 6]



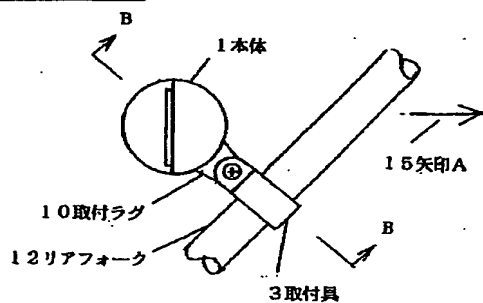
[Drawing 7]



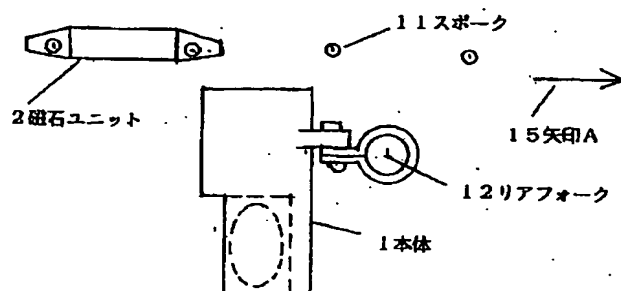
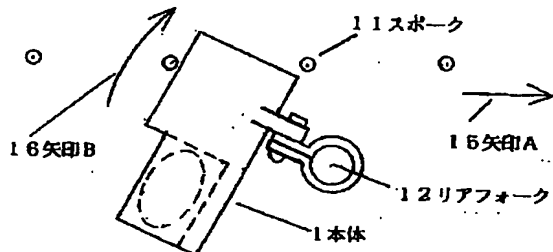
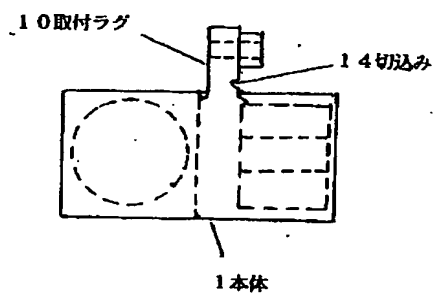
[Drawing 8]



[Drawing 9]





[Drawing 10][Drawing 11][Drawing 12]

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